

## Assessing Effect of Gamification for Primary Pupils' English Learning Performance

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### ABSTRACT

In this era of technology, gamification is one of the ways to motivate students on second language learning. There is an existence of English learning issue in the four English basic skills which are speaking, listening, reading and writing skills for Malaysia's students. Hence, there is a necessity of finding suitable strategies to help English language learning in Malaysia's education. This study was mainly focused on the effect of gamification for primary pupils' English learning performance based on four English basic skills. This study also intended to find out the perceptions of Year 4 pupils on acceptance of gamification via Duolingo. The study investigated the relationship between the overall English performance of pre-test and post-test and the influence of gamification towards English performance. The sample group consisted of 30 Year 4 pupils from a primary school in Johor Bahru district had been selected through purposive sampling for this quantitative study. Survey, pre-test and post-test were being used to collect the data of the study. The results showed that the pupils' acceptance of gamification is highly positive based on the four basic English skills. According to the findings, although there was no relationship between both of the overall performance tests and no influence found in the study but positive effect of gamification via Duolingo was found on the Year 4 pupils English performance based on listening, speaking, reading and writing skills. The findings of this study will provide a vital contribution to the education field by giving a new option of choosing gamification educational tool to enhance second language education. Overall, gamification in technology can be a good educational tool for English language learning but educators must organise the lesson plan well by not deviating from the key focus of the learning.

### Keywords

gamification, Duolingo, English learning performance, technology

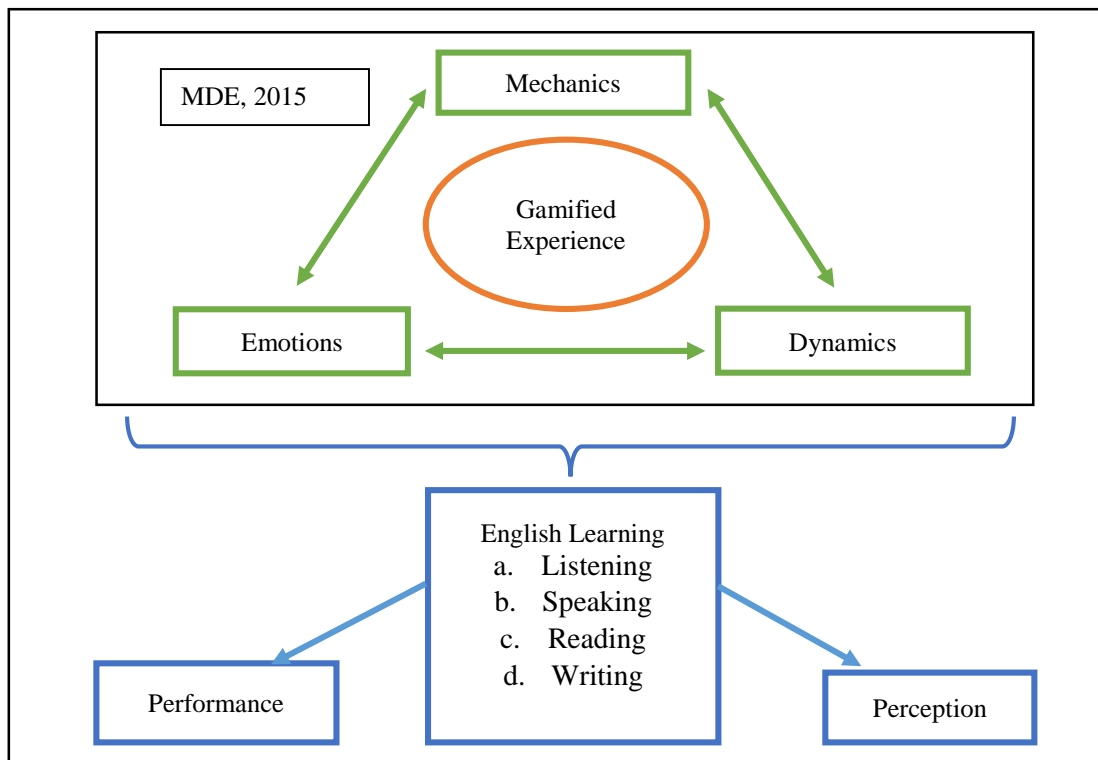
### Introduction

Technology is one of the most effective ways to increase the student's knowledge. The educational occasion can be expanded by using ICT, the mighty influential tool that creating tremendous impacts in the way of learning and teaching. ICT also can be a helpful aid that supplies faster and simplest access to a broad-scale of knowledge (Saxena, 2017). ICT brings vital changes to the community and impacts on every detail of our daily life. ICT also been widely used in teachers' training programmes at present to enhance the quality of teachers that can teach effectively (Ratheeswari, 2018). Technology can be used as a powerful learning transforming tool to shorten the distance between teachers and learners (Stošić, 2015). Now, distance is no more an obstacle with the speedy transformation of technology (Budhwar, 2017)

Besides E-learning in the world of education, a new term, mobile learning or m-learning had appeared. Mobile learning or m-learning is a type of learning through small portable digital equipment such as mobile smartphones, digital tablets and other handheld gadgets (Bukharaev & Wisam Altaher, 2017). To make sure the learners stay consistent while learning by using technology devices, learners need to be stimulating by some methods. Gamification is the use of game components in a setting without games in order to expand the experience of the user (Nand et al., 2019). Gamification that consists of few elements such as levels, rewards, leader boards, etc. based on users' motivation can be used to achieve this requirement (Nabseth, 2017). Mobile learning application that created by using gamification

components can help to assist the learning process and stimulate students to ensure consistency in learning (Hamari, Koivisto, & Sarsa, 2014). This will probably bring significant motivational advantages to second language learning (Garland, 2015).

The following conceptual framework of this research that studying the effectiveness of gamification on primary pupils' English. The conceptual framework is being adapted from MDE framework that developed by Robson, Plangger, Kietzmann, McCarthy, & Pitt (2015) based on the MDA framework gamification principles by Robin Hunicke, Marc LeBlanc (2004) that consists of three important gamification principle that is mechanics, dynamics and emotion. Figure 1. shows the overall conceptual framework of the research.



**Figure 1.** Conceptual framework based on gamification principles: The MDE framework by Robson, Plangger, Kietzmann, McCarthy & Pitt (2015)

## Literature Review

The related theories, principles, findings and discussion from a variety of previous studies will be involved to link with the theme of the study. The outline of the significant literature and reference that can give a bigger picture in the field of the present study is going to be generalized in this chapter.

## Traditional Education Versus Modern Education

The relationship between traditional education and modern education is inseparable but there is an existence of difference in both of these types of education. Modern education is a transformation of traditional education. This point reveals modern education with the development of modern technologies is taking the place of traditional education. In modern education classroom that comprising the newest technology in teaching and learning process that can attract students' interest and attention, even enable the students to explore the latest information with the fastest and easiest way can let the students be more prone to learning compared to the traditional education that is more passive on learning. The learners will become the main characters in the classroom and yet educators are going to be their guides, facilitators, consultants and instructor in the process of teaching and learning. With modern education, students can

replace weighty books with lightweight, advantageous and vivacious e-books that are being updated regularly (Budhwar, 2017).

Nowadays, the study on the internet is widely used in modern education. According to the study of Muralidharan (2018), there were 30% of the students spent 1 to 2 hours per day on the internet, 20% of the students spent 1 to 3 hours per day on the internet, 35% of the students spent 2 to 5 hours per day on the internet and there were also 15% of the students spent approximately 3 to 6 hours per day on the internet. In the study of Cotton (1989), educational time is a factor of the learning. This situation showed that the internet had become one of the vital parts of the students learning time nowadays. From the study of Tahir and Arif (2015), parents nowadays agreed that young primary school pupils are permitted to utilise mobile devices for learning purpose. There were even parents who think that educational applications help their children with their learning skills in order to gain improvements in the study. Modern education had submerged into the learning environment and slowly transformed traditional education to suit the students' learning nowadays.

There are researchers found that many benefits can be gained through ICT in education. There is the access of various learning resources and materials at ease, sustainable learning, knowledge sharing and collaborative learning through communication platform, as multimedia integration's learning aid, distance education via online learning, appropriate storage for data and time saving (Budhwar, 2017; Kaushlendra Pathak & Nawal, 2018; Kawade, 2012).

## **Gamification in Education**

In this era of technology, students nowadays are being called digital natives which modern technologies are one of the companions in their growth. The teachers nowadays must use a teaching approach which can keep up with the footsteps of the modern technology world. Educational challenges that students find the learning is tedious and making the students lose interest and focus on participating in the class actively need to be solved. Educators found students are more interested in accessing the internet than take part in the class. An active learning approach, gamification which included learning content, game and ICT could be a good way to provide motivation to the students in the learning process in class and become another creative approach which can be used by the educators on class management and as a replacement of the general assessments. Gamification can also attract students' attention by integrating gamified learning activities with gamification elements (André Ribeiro, Leal da Silva, & Quadrado Mussi, 2018).

The main idea of gamification is to employ game mechanic techniques in order to build up students' engagement and motivation in their learning process. This reveals that games had become a significant section of students' lifestyles. Students nowadays invest plenty of time in gaming and this shows gamification which combining game elements and game design approaches in a non-game context can perform to engage students in learning process. Gamification is also suitable for students' learning styles nowadays by helping the students to adapt better in learning (Nurul & Mohamad, 2018). According to the case study of Folgieri, Vanutelli, De Vecchi Galbiati, & Lucchiari (2019), the establishment of educational equipment and procedures based on gamification with the fusion of a variety of disciplines had helped an individual to achieve a balanced development on self-learning, self-awareness and self-adaptation.

In the research paper of Jagust, Boticki, Mornar, & So (2017), the researchers found that gamified learning had brought a positive impact on the primary learners' motivation based on the analysis of log data which was being recorded in the research process. The results of this study also can be proved by the continuous learning of the students which is the treatment group of the research which can remain their concentration while doing the mathematic tasks given in a longer time, so they are able to settle more work given by using gamification. Vice versa, the students which is the control group from the research that learn without gamification felt bored rapidly, even work much slower in the practice, then solved lesser exercises given during the research. This study can be one of the prove to address the positive impacts of gamification on young learners.

## **The MDE Framework**

The MDE framework is being used in the conceptual framework of this research that had been mentioned in the introduction previously. The MDE framework proposed by Robson et al. (2015) by adapting the MDA framework as a basis which is designed exclusively as the principle of gamification. The main components of the MDE framework are mechanics, dynamics and emotions. This shows the dissimilarity between the MDE framework and the MDA framework is the substitution of the component, "aesthetics" being exchanged with "emotions". According to Robson

et al. (2015), the aesthetic components in the MDA framework are more particular on computer games, on the other hand, the engagement outcomes of gamification can be more extensive. This highlights the different characteristics between games and gamified techniques. Game is mainly intending to entertain the players, while gamified techniques include non-game associated aspects which can be influential to the outcome of gamification.

Mechanics are being categorized between setup, rule and progression mechanics. For setup mechanics, it represents the surroundings of the experience which brings effects on the entire gamified experience of the users that consists of preliminary setting. Rule mechanics represents the permitted operations and restriction of the gamified experience. Progression mechanics clarify the augmentations which act as a presence in gamified experience in order to influence the behavior and experience of the users. These mechanics consists of distinct progression components. Gamification mechanics are being set before users experience the actual process of gamification and gamification mechanics will maintain as an unchanging element or static element from beginning till the end in the experience (Robson et al., 2015).

Dynamics can represent the way players interact with gamification mechanics which emerge from the number of players who follow these mechanics and hard to forecast and might lead to either positive or negative behaviours of the users (Robson et al., 2015). The settings of mechanics and dynamics of gamification are to stimulate the appropriate emotions of the users. The desirable emotional reactions are supposed to be interesting and fun-oriented in order to reach the goal of gamification of giving full gamified experiences to the users. It is an essential action to shift the word “fun” away as the main goal of emotional components in gamification but should think more about the fundamental experiences that give the users a fun gamified experience (Robin Hunicke, Marc LeBlanc, 2004).

### **Gamification in Second Language Education**

According to the study of Hjert (2015), there are adequate of proof to prove the integration of gamification can motivate students and cut down the workloads of teacher in English language teaching and learning process. In the study of Ogo-Chukwu, Chinyelu (2019), the results of the research showed that gamification provides a positive effect on English language learners’ learning outcome and engagement level, but the learning outcomes of the treatment group and control group were not obviously distinct. Game elements can give students an enjoyable and interactive learning experience and helps students to gain knowledge with better retention on it. Gamification is capable of rise the overall learning experiences of the students in English language learning. This result shows the integration of gamification in English language teaching and learning process in primary schools necessary (Ogo-Chukwu, Chinyelu, 2019).

Additionally, based on the study of Dehghanzadeh *et al.* (2019), gamification had been proposed with positive learning outcomes the most in second language learning. There are 15 publications related to vocabularies learning, 5 publications related to grammar learning and speaking skills respectively, 4 publications related to pronunciation and listening skills independently and 3 publications related to writing skills which being stated with gamification in second language learning environments stimulated positive learning outcomes in the related learning and skills of the second language including the four basic English skills (Dehghanzadeh et al., 2019). These publications proved that gamification had performed its effect in second language learning.

### **Duolingo in Second Language Learning**

Duolingo is being selected as the platform to implement gamification in this research for English language learning. According to Duolingo (2016), Duolingo is the largest online language learning platform in the world which utilised Science and adaptive learning techniques in the platform in order to give the users a fun and effective language learning experience using this platform. Duolingo mobile application was being recognized as Apple’s iPhone App of the Year of 2013, Google Play’s Best of the Best of 2013 and 2014 and TechCrunch’s Best Education Startup of 2014. According to the official website of Duolingo, there are more than 30 languages that can be chosen by the users and Duolingo also has a total of 300 million users from all around the world. Duolingo is a free-of-charge online language learning platform that being developed by professor Luis von Ahn which is the inventor of CAPTCHAs, his Ph.D. graduate student Severin Hacker and their team in Duolingo Inc (Duolingo, 2016; Jašková, 2014). The founders of Duolingo developed this language learning platform with the intention to provide free language education to the whole world with the slogan “Free language education for the world” (Munday, 2015).

Moreover, the study of Nadiawati (2018) revealed that Duolingo is able to give motivation to the students in their second language learning from the data analysis result. Duolingo which consists of interesting components of

gamification had brought a positive effect to the students. A variety of lessons such as listening, speaking, grammar checking and translating activities in Duolingo had built up students' interest in learning the language and more confidence to speak in English by using Duolingo. Students can gain many new pieces of knowledge by using Duolingo. Nadiawati (2018) also stated that students who interested in playing games, even students who like to read would be fond of Duolingo is a good learning tool that is different from the traditional learning approach. Duolingo also can provide pronunciation learning material with pictures for the purpose of learning about nouns. Duolingo has a variety of lessons in each level which allow students to learn conveniently in any place at any time and enhance self-learning which is entertaining by using a mobile gadget compared to a book (Nadiawati, 2018).

In addition, according to the study of (Latief, 2019) which reported Duolingo is an application that is easy to use by the users. The lessons of Duolingo are informative, easy to navigate and free from charges or payment. The content of Duolingo set according to various language subjects with the learning about grammar. Duolingo also provided related grammar tips and notes in every lesson. Users also can learn language by using Duolingo on different types of digital equipment that they prefer in order to track an individual's learning progress record. Latief (2019) also stated that the "Daily Goals" feature can help to motivate the users in learning. Users can even use the rewards that is gained from the performance in the virtual shop of Duolingo.

## **Malaysia's English Education**

There are four basic skills in English language learning that need to be learned from the students: listening, speaking, reading and writing. Speaking and writing skills are productive skills. When learners are using these two skills, there are basically not only active but make sounds while they speak and produce symbols like letters in writing skills. Vice versa, listening and reading are being categorised under receptive skills. When the learners are utilising these two skills, they remain passive and just accept the information from what they listen and read (Husain, 2015). Listening and speaking skills are interconnected with each other. With the combination of these two skills, the oral communication skills of students will be stimulated to become more effective. For reading and writing skills, they have a strong relationship in each other by being a useful technique to success in writing communication (Sadiku, 2015).

The Malaysia Education Blueprint 2013-2025 had stated that the Ministry of Education hope to enhance the proficiency of English language as the first priority with *Bahasa Malaysia* which the students of Malaysia will achieve a minimum foundation of literacy in both of these languages after three years of schooling, 70% of students which are at the end of the secondary study will get the minimum credit in SPM's English subject against Cambridge 1119 standards. Ministry of Education also will make English subject a compulsory subject that needs to pass by all the SPM candidates and enhance all primary and secondary school's language learning to provide a better chance for the Malaysian students to learn more language by the year 2025. One of the enhancements that are aligned with English language learning is to improve ICT in order to raise quality education in Malaysia.

## **Implementation of CEFR in Malaysia's English Education**

Based on the news report Mohd Don and Abdullah (2019) in the official website of Ministry of Education, the English Language Education Reform in Malaysia: The Roadmap 2015-2025 was being launched by the Ministry of Education in order to has a significant enhancement on the students' English language proficiency. The roadmap is basically a reform plan in order to enhance English language education in Malaysia which the students can transform into a successful and expert English language user that takes 10 years to implement the plan. The roadmap also points out in detail about the way of improvisation on teaching and learning process from preschool to university levels in the "Aspirational Targets" and also included teacher's training based on the current needs for the learning environment and expected communication of the students in Malaysia. In "Aspirational Targets", preschool children are being targeted to achieve A1 level, primary school pupils are being targeted to achieve A2 level, secondary school students need to achieve B1 level, post-secondary students need to achieve B2 level and university students are being targeted to achieve at least B2 level to C1 level.

Hence, the CEFR which stands for The Common European Framework of Reference is being applied in the roadmap. The CEFR is an international standard tool in order to describe and measure language proficiency at each of the stage in education. The integration of CEFR in English language education of Malaysia will brings the changes in curriculum, teaching and learning and evaluation throughout the related process. Teacher education and training will be all CEFR-aligned including their English proficiency and the teaching skills. The roadmap with the integration of

CEFR is to target the proficiency levels in every stage of education. With the assist of specialist in CEFR from Cambridge English, the United Kingdom who had carried out a related baseline study in the year of 2013 for the purpose to measure the CEFR levels which were being achieved by the students in our schools at that time and there was a follow-up study was being carried out in the year of 2017 with small adjustments done. The related practical targets will be set for the incoming year of 2025 based on the results obtained from the study (Barni & Salvati, 2016). Duolingo is also aligned with the CEFR. According to the founder of Duolingo, the users who accomplished all the units can be achieved at least the high-intermediate proficiency level (B2) based on the levels of the CEFR (Duolingo Inc, 2015).

## **Methods**

The rationale of appointing the research design for this study will be elaborated in this chapter. Elucidation about the research sampling, research instruments and research procedure to collect the data of this study will be further explained in the following subchapters.

### **Research Sample**

Non-probability and purposive sampling techniques were being utilised in this research to select the samples. The samples were being chosen from a primary school in the District of Johor Bahru. In this research, there are total of 30 pupils will be selected as the sample to be an indication of the pupils' performance and perceptions of Johor Bahru district. The samples are being selected from Year 4 pupils that having similar ICT background. The identity and details of the samples will be kept anonymous and confidential to fulfill the ethics of research based on the non-probability sampling approach requirements.

The reason for choosing Year 4 pupils as the samples of the study is because they are the first badge of the Year 4 pupils which using the latest Year 4 syllabus. The pupils will need extra help on their learning by being the first group to face the latest CEFR syllabus. Besides, Year 4 pupils that are from phase 2 (Year 4 to Year 6) will have a better understanding and discipline compared to the pupils from phase 1 (Year 1 to Year 3). The pupils at this age of 10 are generally getting familiar with the uses of technology such as computers, tablets, laptops or mobile phones. Samples being selected at this age also are able to cooperate and commit better during the lessons.

### **Research Approach**

Quantitative approach was being chosen in this research by the researcher. Quantitative research is a method used to measure and analyse the variables for the purpose to get the data and the final result of a study in the form of numerical (Apuke, 2017). For this research, pre-experimental design is being chosen. There is a group of Year 4 pupils is being selected as the sample group that going to undergo the pre-test and post-test process to determine initial marks and the effects of gamification on the target group after a month of usage on Duolingo for English language learning. Purposive sampling method is being used to select the sample group in this study. The pre-test evaluation will be given to the sample group with the purpose to identify the needs and standards of the sample group. A pilot study as a small scale of preliminary study was being carried out before the actual research being conducted to make improvement on the prior study design with the main purpose to test the validity and reliability for the items being set in the questionnaire for the research. Survey approach will also be applied to the sample group in order to obtain the data about pupils' perception on the acceptance of gamification via Duolingo in English learning based on the four English basic skills (listening, speaking, reading and writing) after the samples had experienced Duolingo for a month. This process is going to carry out with the questionnaire developed by the researcher.

### **Research Instruments**

For this research, the researcher will make use of two types of main instruments to collect the data from the samples. The main instruments are pre-test assessment, post-test assessment and survey questionnaire. The pre-test and post-test were being set based on the learning content from the English lessons given based on their learning topic by integrating gamification via Duolingo for around one month. First, a pre-test will be distributed to the research samples before the treatment is being carried out, then the post-test will be done after the lessons had been experienced by the samples.

For the questionnaire, the related items will be set to know the samples' perceptions on the acceptance of gamification via Duolingo on their English learning. There are two parts (Part A and Part B) will going to be included in the questionnaire. Before the actual research starts, 12 sets of questionnaires were being distributed to the pilot test's sample group that contained 12 pupils. The questionnaire in paper form was being done by 12 random primary school's Year 4 pupils that have similar characteristics of ICT background with the actual research samples. Related responses were being collected after the experience session. The result of the pilot test which the value of Cronbach's alpha is 0.814 represents a high level of interval consistency for the scale. This result showed that this questionnaire is suitable to use in the study.

### Pre-test and Post-test

For the purpose to answer the research questions in the research, a pre-test and a post-test will be distributed to the sample group that is selected in this research. The aim of having pre-test and post-test is to identify the effects of gamification via Duolingo on primary pupils' English performance. The research samples will be tested on the relevant learning content from their latest syllabus with the assist of gamification via Duolingo based on the four basic language skills (listening, speaking, reading and writing). Both of the tests were being verified by two experienced English teachers' leaders in order to validate the questions of the tests which are suitable for Year 4 pupils. Transcript and marking guide for both of the tests were being developed as a marking standard to standardise the marks given to both of the related tests.

### Survey

The researcher had designed a survey in a form of questionnaire that will be utilised in order to collect data needed from the research samples of this research. The questionnaire consists of items related to the primary pupils' perceptions on the acceptance of gamification via Duolingo in English learning based on four English basic skills which are listening, speaking, reading and writing. The questionnaire was being transferred to Google Form. Instructions and guidance will be provided throughout the survey to guide the respondents to complete the questionnaire given.

**Table 1.** Parts and quantity of related items consists in the questionnaire

No.	Section	Items
1	Part A: The demographic background	5 items
2	Part B: Section 1: Perceptions on gamification via Duolingo based on English listening skills.	5 items
3	Part B: Section 2: Perceptions on gamification via Duolingo based on English speaking skills	5 items
4	Part B: Section 3: Perceptions on gamification via Duolingo based on English reading skills	5 items
5	Part B: Section 4: Perceptions on gamification via Duolingo based on English writing skills	5 items
	<b>Total</b>	<b>25 items</b>

Two experienced lecturers which currently teaching in the researcher's university were being invited to review and ensure the validity of the questionnaire being developed by the researcher according to the needs of the research. 30 respondents from the sample group were being requested to read each of these statements carefully and make their choice based on the 4-point Likert scale with scores from 1 to 4. Each score carries the meaning of:

**Table 2.** Scale and meaning of the Scale in the questionnaire

Scale	Meaning
1	Strongly Disagree
2	Disagree
3	Agree
4	Strongly Agree

### Data Analysis

After the data collection process, all the raw data collected will be further analysed descriptively and inferentially by using Statistical Package for Social Science (SPSS) software. The data will then be computed, summarised and interpreted into meaningful data for the study.

#### Analysis of Primary Pupils' Perception

The questionnaires of the study that is in the form of a 4-point Likert scale were being done by the sample group. Scoring of the items is according to ordinal scale measurement. For the purpose of analyse primary pupils' perception towards gamification, descriptive analysis will be chosen to run in this part of the research. Mean value and standard deviation will be acquired for each item for both of the constructs. Each constructs' total scores will be classified into four categories of interpretation based on the scale and range as shown in the following table.

**Table 3.** 4-point Likert scales, range and categories of interpretation

Scale	Range	Categories of Interpretation
Strongly Disagree (1)	1.0-1.4	Very low
Disagree (2)	1.5-2.4	Low
Agree (3)	2.5-3.4	High
Strongly Agree (4)	3.5-4.0	Very High

#### Analysis of Primary Pupils' English Learning Performance

The final score of pre-test and post-test did by the sample group of the research will be analysed with inferential statistics to find the comparison of the significance correlated level of the research samples. Shapiro-Wilk normality test will be conducted before the statistical analysis was being selected in order to test the normality of the data. Next, a parametric test, the paired sample t-test (Data is normally distributed.) or Wilcoxon signed-rank test (Data is not normally distributed.) will be chosen to run the process of data analysis. Lastly, the researcher will compute the effect size of Cohen's d for paired sample t-test in order to identify the difference between the variables for improving the accuracy of the research.

#### Analysis Relationship Between Primary Pupils' English Overall Performance Before and After Using Gamification via Duolingo

In this analysis, Shapiro-Wilk normality test is being chosen to run before conduct the analysis. Either Pearson's correlation coefficient (Data is normally distributed) or Spearman's rank-order correlation coefficient (Data is not normally distributed) will be applied to test the relationship between primary pupils' English overall performance in their pre-test and post-test in order to identify the relationship on both of the tests' overall performance. Cohen (1988) proposed and classified that an absolute value ( $r$ ) of 0.5 is large, an absolute value ( $r$ ) of 0.3 is medium and an absolute value ( $r$ ) of 0.1 is small.

#### Analysis Influence of Gamification Before and After Utilising Duolingo on Year 4 Pupils' English Overall Performance

For this analysis, simple linear regression analysis is being chosen to analyse the data of the overall score of the pre-test and the overall score of the post-test. This is to find out whether there is a positive or negative influence of gamification via Duolingo on Year 4 pupils' English overall performance. A scatterplot chart will be included in this analysis to show the result of the analysis.



## Results

The data obtained from the 30 sets of questionnaires, 30 sets of pre-test and 30 sets of post-test which being done by the 30 samples of the study were being analysed and discussed in this chapter. The aim of the study was to find out the effect of gamification via Duolingo on primary pupils' English learning performance in four English basic skills. The related data and results were being generated by utilising Statistical Package for Social Science (SPSS) version 22.0 which based on the field of the study.

### Year 4 Pupils Perception on Gamification via Duolingo in English Learning

The findings in this subchapter were used to address the first objective stated in the study which in order to investigate Year 4 pupils' perception toward gamification via Duolingo in English learning based upon English basic skills. 30 respondents gave their responses on the perception of acceptance of gamification via Duolingo in their English learning from the survey by using 4-point Likert scale (Strongly Disagree, Disagree, Agree and Strongly Agree). This part was focusing on Part B of the survey that contained 20 items. The items were being separated into 4 parts (5 items per part) focused on four English basic skills.

**Table 4.** Item's mean value and standard deviation based on English listening skills

No	Item based on English listening skills	Mean	Std. Deviation
1	I feel using Duolingo gives me more improvements on my English listening skills.	3.50	.509
2	I feel more confident in English listening by using Duolingo.	3.40	.621
3	I feel Duolingo helps me to focus on English listening skills.	3.47	.507
4	I feel scores, rewards and leader boards in English listening skills.	3.70	.466
5	I feel I am able to understand the main idea of simple texts after using Duolingo	3.53	.507
	Overall	3.52	.522

The table above showed the respondents' perception on acceptance of gamification via Duolingo in English learning based on listening skills. The overall mean that shown in Table 4, it revealed the overall mean of 3.52 which was the highest mean and the overall standard deviation was 0.522. The fourth item that gained the highest mean which was 3.70 and the standard deviation of 0.466 among all of the items in this section showed that the respondents feel scores, rewards and leader boards in Duolingo are suitable to increase their interest in English listening skills. Next, the fifth item which stated that 'I feel I am able to understand the main idea of simple texts after using Duolingo,' had the mean value of 3.53 which was the second highest and standard deviation of 0.507, followed by the first item that stated 'I feel using Duolingo gives me more improvements on my English listening skills' which the mean was 3.50 with the standard deviation was 0.509 and the third items that stated 'I feel Duolingo helps me to focus on English listening skills' which the mean was 3.47 and the standard deviation for this item was 0.507. Moreover, the statement with the mean of 3.40 which was the lowest mean with the standard deviation of 0.621 in this section was 'I feel more confident in English listening by using Duolingo'.

**Table 5.** Item's mean value and standard deviation based on English speaking skills

No.	Item based on English speaking skills	Mean	Std. Deviation
1	I feel using Duolingo gives me more improvements on my English speaking skills.	3.57	.504
2	I feel more confident in English speaking by using Duolingo.	3.53	.507
3	I feel Duolingo helps me to focus on English speaking skills.	3.60	.498
4	I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English speaking skills.	3.50	.509
5	I feel I am able to describe people or object using suitable words after using Duolingo.	3.53	.507
	Overall	3.55	.505

Table 5 showed the mean value and the standard deviation in part B of the questionnaire that related to the pupils' acceptance of gamification via Duolingo in English learning based on speaking skills that gained the overall mean of 3.55 and the overall standard deviation was 0.505. Item 3 that collected the data about whether Duolingo helps the respondents to focus on English speaking skills had gained the mean of 3.60 which was the highest mean and the standard deviation was 0.498 among the other items in this section. Item 1 that stated 'I feel using Duolingo gives me more improvements on my English speaking skills' was the item that gained the mean value of 3.57 which was the second highest and the standard deviation of 0.504. Then, it followed by item 2 that stated 'I feel more confident in English speaking by using Duolingo' and item 5 that stated 'I feel I am able to describe people or objects using suitable words after using Duolingo' had got the mean value of 3.53 and the standard deviation of 0.507 respectively. Item 4 that mentioned the scores, rewards and leader boards in Duolingo are suitable to increase the respondents' interest in English speaking skills gained the mean value of 3.50 which was presented as the lowest mean with the standard deviation of 0.509 compared to the other items in this section based on English speaking skills.

**Table 6.** Item's mean value and standard deviation based on English reading skills

No	Item based on English reading skills	Mean	Std. Deviation
1	I feel using Duolingo gives me more improvements on my English reading skills.	3.53	.507
2	I feel more confident in English reading by using Duolingo.	3.50	.572
3	I feel Duolingo helps me to focus on English reading skills.	3.57	.504
4	I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English reading skills.	3.67	.479
5	I feel I am able to read the texts of one or two paragraph after using Duolingo.	3.43	.568
	Overall	3.54	.526

In the third section of Part B in the survey, the data about the respondents' acceptance of gamification via Duolingo in English learning based on reading skills had been collected. The overall mean of this section was 3.54 with an overall standard deviation of 0.526. Based on Table 6, item 4 that mentioned whether the scores, rewards and leader boards in Duolingo are suitable to increase my interest in English reading skills had the mean of 3.67 which is the highest with the standard deviation of 0.479. Item 3 that stated 'I feel Duolingo helps me to focus on English reading skills' had the second highest mean value which was 3.57 and the standard deviation of 0.504. Item 1 that related to whether Duolingo gives the respondents more improvements on their English reading skills got the mean of 3.53 and the standard deviation was 0.507, followed by item 2 that stated 'I feel more confident in English reading by using Duolingo with the mean

value of 3.50 and the standard deviation of 0.572. Item 5 that mentioned the statement of ‘I feel I am able to read the texts of one or two paragraph after using Duolingo’ had gained the mean value of 3.43 and the standard deviation was 0.568.

**Table 7.** Item’s mean value and standard deviation based on English writing skills

No.	Item based on English writing skills	Mean	Std. Deviation
1	I feel using Duolingo gives me more improvements on my English writing skills.	3.43	.568
2	I feel more confident in English writing by using Duolingo.	3.47	.507
3	I feel Duolingo helps me to focus on English writing skills.	3.50	.509
4	I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English writing skills.	3.53	.571
5	I feel I am able to describe basic everyday routines in writing after using Duolingo.	3.43	.504
	Overall	3.47	.532

From the last section of the survey that related to writing skills, Table 7 showed the overall mean value of this section was 3.47 and the overall standard deviation was 0.532. The item that gets the highest mean among the items in this section was item 4 that stated ‘I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English writing skills’. Item 3 mentioned whether Duolingo helps the respondents to focus on English writing skills had gained a mean of 3.50 and the standard deviation was 0.509 which turned out with the second highest mean in this section, Item 2 stated the statement of ‘I feel more confident in English writing by using Duolingo’ got the mean value of 3.47 and the standard deviation was 0.507. Lastly followed by item 1 that stated ‘I feel using Duolingo gives me more improvements on my English writing skills (standard deviation=0.568) and item 5 with the statement ‘I feel I am able to describe basic everyday routines in writing after using Duolingo’ (standard deviation=0.504) had the same mean which was 3.43 in this section respectively.

### **The Effect of Gamification via Duolingo on Year 4 Pupils’ English Performance Based on Four English Basic Skills**

The results of the analysis to find out the effect of gamification via Duolingo on Year 4 pupils’ English performance based on the English basic skills which were being addressed in this subtopic.

The effect of gamification via Duolingo on Year 4 Pupils’ English performance based on listening skills were being addressed with the data collected. This research data was bringing a purpose to investigate whether there is a presence of significant difference betwixt both of the tests which were stated as the research question for the study by using Wilcoxon signed-ranks test.

**Table 8.** Result of Wilcoxon signed-ranks test between listening pre-test and listening post-test

	Listening Post-test – Listening Pre-test
Z	-2.383
Asymp. Sig. (2-tailed)	.017

According to Table 8, the Wilcoxon signed-rank test was being selected to analyse the raw data because these data were not normally distributed. Then, the results of the test proposed that the score of listening pre-test did elicit a statistically significant different with the score of listening post-test (Z= -2.383, p=0.017).

The effect of gamification via Duolingo on Year 4 Pupils' English performance based on speaking skills was being presented with the data collected. This data in the research was utilised to investigate whether there is a presence of significant difference betwixt the score in both of speaking pre-test and speaking post-test which was listed as the research question for the study by conducting paired sample T-test.

**Table 9.** Result of paired samples T-test between speaking pre-test and speaking post-test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Speaking Pre-test – Speaking Post-test	-.667	2.998	.547	-1.786	.453	-1.218	29	.233

The data gained were normally distributed after the test of data normality by using Shapiro-Wilk test of normality. Therefore, the paired sample T-test was being utilised to analyse the score from the speaking pre-test and speaking post-test. Based on Table 9, the Sig. (2-tailed) value was 0.233 and it was greater than 0.05 ( $p > 0.05$ ). This result presented that there is no appearance of significant difference of the score from both of the tests. Cohen's d effect size was also being computed and the result of d was 0.308. It showed that the effect size was small.

The effect of gamification via Duolingo on Year 4 Pupils' English performance based on reading skills were being analysed with the data collected. This research data that being gained was utilised to discover whether there is a presence of significant difference among the score from both of the reading tests which was one of the research questions in the study. The data was being analysed by using Wilcoxon signed-ranks test.

**Table 10.** Result of Wilcoxon signed-ranks test between reading pre-test and reading post-test

	Reading Post-test – Reading Pre-test
Z	-3.910
Asymp. Sig. (2-tailed)	.000

Based on Table 10, the data was being analysed by using Wilcoxon signed-rank test. This is because the data were not normally distributed shown in the Shapiro-Wilk test of normality. The findings of the tests presented that  $Z = -3.910$  and the Asymp. Sig. (2-tailed) value was 0.000. Therefore, it presented that p value of 0.000 is less than 0.05 ( $p < 0.05$ ). Hence, the finding is statistically significant. This proved that there was an appearance of significant difference between the score from both of the reading tests.

The effect of gamification via Duolingo on Year 4 Pupils' English performance based on writing skills were being analysed with the data collected in this subchapter. The data that is collected was being utilised to investigate whether there is a significant difference betwixt the score in both of the writing tests. These data were also being analysed by utilising Wilcoxon signed-ranks test.

**Table 11.** Result of Wilcoxon signed-ranks test between writing pre-test and writing post-test

	Writing Post-test – Writing Pre-test
Z	-4.458
Asymp. Sig. (2-tailed)	.000

In Table 11, Wilcoxon signed-rank test was being chosen to analyse the raw data. This is because the data were not normally distributed after being tested by the Shapiro-Wilk test of normality. The findings showed that  $Z = -4.458$  and the Asymp. Sig. (2-tailed) value was 0.000. This result proposed that p value of 0.000 is less than 0.05 ( $p < 0.05$ ). Consequently, the finding is statistically significant. This also verified that there is a presence of significant difference between the score from both of the writing tests.

### The Relationship Between the Year 4 Pupils' English Overall Performance Before and After Using Gamification via Duolingo

This subtopic presented the findings that being analysed by using Pearson correlation on the Year 4 pupils' English overall performance with and without using gamification via Duolingo. The findings based on the overall score of pre-test and the overall score of post-test were being used to examine whether there is a relationship between both of the tests.

**Table 12.** Result of Pearson correlation between pre-test's overall score and post-test's overall score

		Overall Score of Pre-test	Overall Score of Post-test
Overall Score of Pre-test	Pearson Correlation	1	.310
	Sig. (2-tailed)		.096
	N	30	30
Overall Score of Post-test	Pearson Correlation	.310	1
	Sig. (2-tailed)	.096	
	N	30	30

The Pearson correlation was utilised to analyse the raw data because the data were normally distributed. Table 12 presented the value of  $p = 0.960$  which was more than  $\alpha = 0.05$ . There is no relationship between the overall score in both of the tests. There was a weak positive correlation between the pre-test's overall score and the post-test's overall score, which was not statistically significant ( $r = 0.310$ ,  $n = 30$ ,  $p = 0.096$ ).

### The Influence of Gamification Before and After Utilising Duolingo on Year 4 Pupils' English Overall Performance

The findings in this subchapter are to find out whether there is an influence of gamification via Duolingo on Year 4 pupils' English overall performance. Linear regression was being used to examine whether there is a presence of significant relationship between the overall score in both of the tests.

**Table 13.** Model summary of simple linear regression analysis for the overall score of post-test and the overall score of pre-test

Model	R	R.Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.310 <sup>a</sup>	.096	0.64	4.296	2.330

a. Predictors: (Constant), Overall Score of Pre-test

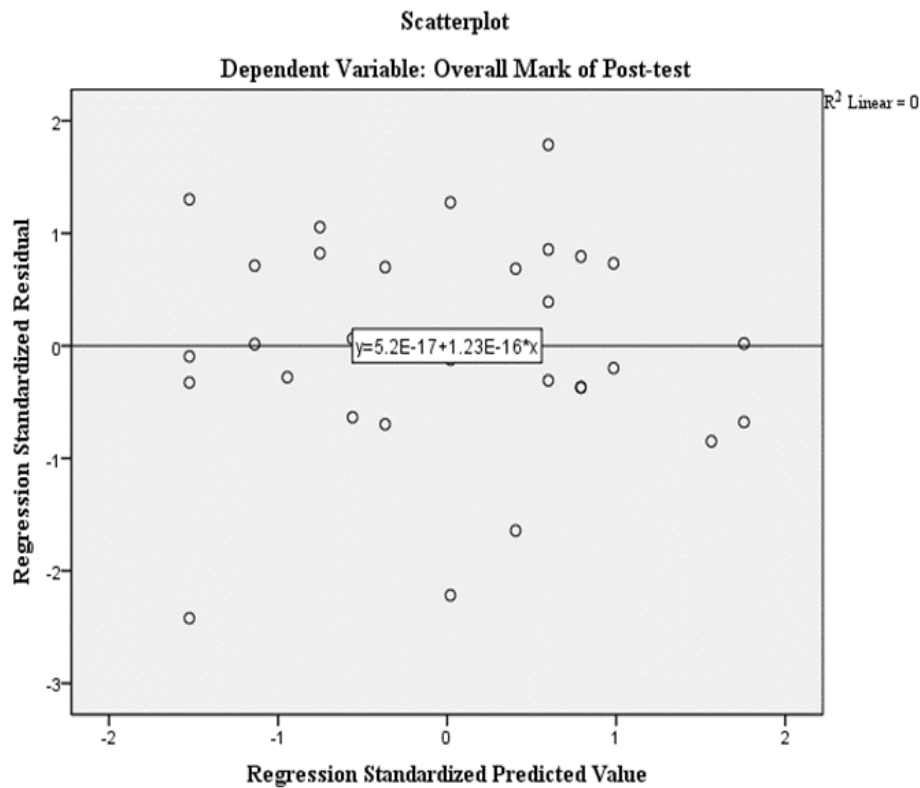
**Table 14.** ANOVA table of simple linear regression analysis for the overall score of post-test and the overall score of pre-test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.761	1	54.761	2.967	.096
	Residual	516.739	28	18.455		
	Total	571.500	29			

**Table 15.** Coefficients table of simple linear regression analysis for the overall score of post-test and the overall score of pre-test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.814	2.279		6.939	.000
	Overall Score of Pre-test	.265	.154	.310	1.723	.096

A simple linear regression was being conducted to analyse the post-test’s overall score based on the pre-test’s overall score. According to the tables above that presented the findings of the simple linear regression which showed that post-test concluded 9.6% of the variance, ( $R^2=0.096$ ,  $F(1,28) = 2.967$ ,  $p > .001$ ). Hence, this result also can be proved by the following figure (Figure 1.1) which was the scatterplot that being plotted by using SPSS. The slope line which lied on 0 showed that there is no presence of linear influence for the post-test’s overall score and the pre-test’s overall score with linear regression analysis.



**Figure 2.** Scatterplot of simple linear regression for the overall mark of post-test and the overall mark of pre-test

## Discussions

In the first section of the survey, the findings showed a high acceptance of gamification via Duolingo based on the English listening skills for Year 4 pupils and it represented that the sample group felt that gamification is effective on their English listening skills. This can be proved with the item that stated “I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English listening skills” which got the highest mean value and the lowest standard deviation value among the other items in this section. The researcher found that this finding had a similar scene with the study of Dehghanzadeh *et al.* (2019) which presented that listening skills in learning languages can be improved by the use of gamification.

In addition, the sample group responded that they felt Duolingo can help them to focus on English speaking skills which the item being listed as the third item in the survey that got the highest mean and the lowest standard deviation in the second section of the survey. This finding is literally matched with the situation stated in the study of Dehghanzadeh *et al.* (2019) which reported that gamification can help learners in their speaking skills. From the finding of the third section of the survey, it showed that the fourth item which stated “I feel scores, rewards and leaderboards in Duolingo is suitable to increase my interest in English reading skills” had the highest mean and the lowest standard deviation in this section. This situation showed that the elements of gamification such as scores, rewards and leader boards of Duolingo can attract the attention and enhance the pupils’ interest in English reading skills. This finding can be supported by the study of André Ribeiro *et al.* (2018) which presented that gamification can attract students’ attention by implementing gamification elements in the gamified learning activity.

The overall finding in the last section of the survey, it showed that the respondents also had provided a highly positive response to this particular section and agreed with the statements listed in the five related items. The fourth item that stated “I feel scores, rewards and leader boards in Duolingo are suitable to increase my interest in English writing skills” gets the highest mean in this section. This meant the respondents agreed with this statement after they used Duolingo in English learning. The statement in the study of Dehghanzadeh *et al.* (2019) that stated gamification provides positive learning outcomes in writing was literally backed this finding in English writing skills.

In essence, the sample group of the study which is Year 4 pupils’ perception on acceptance of gamification via Duolingo in English learning based on the four English basic skills (listening, speaking, reading and writing) is high where the mean values that is collected from the items in the survey are high. This result means that the pupils feel that gamification via Duolingo is suitable to use in English learning to enhance the four English basic skills. This finding can be attested with the study of Nurul and Mohamad (2018) that presented gamification suits the learning style of the students nowadays which can help the students for a better adaptation in their learning. An educational website or application such as Duolingo with a gamification element can attract young learners to maintain their English learning pace by achieving the daily goals and challenge the higher level of practice by completing the tasks that is assigned to them through Duolingo for Schools which can allow them to earn more virtual rewards such as points and badges in Duolingo.

Although there are no correlation and influence found in the overall performance of English in this study but there is a significant difference between the performance of listening, reading and writing pre-test and post-test and there is also a small effect size occurred in between the performance of speaking pre-test and speaking post-test. The findings that showed there is a slight improvement of the pupils’ English speaking performance has resembled the study of Dehghanzadeh *et al.* (2019) that stated language learning environment with gamification gave a positive learning outcome on students’ speaking performance. Based on the findings of this study, the implementation of gamification into the teaching and learning process is recommended to increase the interest and make the pupils have a fun experience while learning English. The findings also in conformity with the study of Nadiawati (2018) that reported Duolingo with gamification elements brought a positive impact to the students on their language learning. The gamification elements such as rewards, leader boards, levels, points and badges that being used in educational websites or applications such as Duolingo can build up their interest in learning languages, even can make the pupils learn unconsciously through gamification system.

## Conclusion

Gamification is being encouraged to use in the primary schools’ language teaching and learning process by using suitable educational tools based on the needs of the pupils and the facilities for educational purposes. Duolingo with

gamification elements also can be used by the pupils outside of the classroom as a self-learning tool in language learning after school. It cannot be denied that gamification in technology can be a good tool for the educational purpose such as English language learning but teachers or educators must organise the lesson plan with gamification well and use gamification wisely in the teaching and learning process by not deviating from the main objectives of the lesson or key focus of the learning. Parents also play an important role to control the usage of technology devices of the pupils while they are at home and make sure that the children are using the technology in the right way for educational purposes.

The researcher hopes that this study can contribute related knowledge on the use of gamification which can help to enhance the teaching and learning process of primary school level, especially in language learning. It is also hoped that this study can raise awareness about the importance of educational technology that can be implemented into 21st century learning with related tools that are suitable for educational purposes and goals in order to boost and stimulate the learning progress by creating an effective learning environment for the pupils.

### Limitations and Future Studies

In this study, there were a few limitations that should be further considered for the other researchers to enhance and extend the future research in this region. One of the limitations that is found in this study is the focus of the study is about primary level's English. The range of the study is still limited which there are many levels and other languages can be further explored. Besides that, the samples only included a small range of Year 4 pupils in Johor Bahru. So, the findings of the study cannot represent all of the primary schools that used Duolingo as a language learning tool. Duolingo is also still not widely used in Malaysia's education. The study is also focusing on the pupils' performance and perception on the acceptance of gamification. The perception of the teacher is not included in the study.

Nowadays, 21<sup>st</sup> century learning is being implemented in education. Therefore, the findings of this research can provide an important contribution to the field of education in this age of technology. This study also can give a new option of using a gamification educational tool in second language education to enhance the teaching and learning process to the maximum level. The future research that being focus on this field is being suggested to extend in the other way that covers a bigger range of the population. The future researcher is also being recommended to include the perceptions or experiences on the gamification of the educators. Furthermore, future research also can study other subjects with other levels of learners in different states or districts.

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